TENNESSEE VALLEY AUTHORITY

U. S. ENVIRONMENTAL PROTECTION AGENCY

TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION

QUARTERLY PUBLIC MEETING

DECEMBER 8, 2011

ROANE COUNTY HIGH SCHOOL

KINGSTON, TENNESSEE

**PANEL:**

CRAIG ZELLER, EPA

KATIE KLINE, TVA

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PUBLIC SPEAKERS PAGE

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KATIE KLINE: Good evening, everybody. Per the agenda, let me just introduce a few people here to night. I'm Katie Kline with TVA. We have just a few folks here. We're glad you came. We have several folks here to night if you're interested in asking questions afterwards or during the presentation, feel free.

Craig Zeller with the EPA Region 4 is going to give a presentation on the update of the site tonight and what is going on in terms of operations. Joni Morgan is with the Community Advisory Group. She's here tonight and members of the Community Advisory Group are also here with her. Steve McCracken, the general manager of the clean-up, is back here if you have questions about that. Michelle Kegley, our environmental manager, is back here. So they will be glad to answer any questions you might have.

Let me give you a short -- before Craig starts, let me give you just a short update on the restoration of the embayments and recreation plan. We have

moved forward with that. We have a master planner in place. They are working right now to develop some plans which we will share at a later date. So that is in progress. You'll hear more about that later. We don't really have a lot of updates for you now on it other than to tell you it's in progress and you will be hearing more.

So that's a pretty short and sweet update. But I'm going to turn it over to Craig who will give you an update on the operations on the site. Then if you have questions afterwards, you can ask him or obviously this is fairly informal, if you have questions during the presentation, please feel free to ask them.

CRAIG ZELLER: Thank you, Katie. Good evening. Thank you for coming. Again, my name is Craig Zeller. I've been the project manager on this here for a couple of years. I guess the last public meeting update we had I think it was late February. So we wanted to kind of take this time at the end of the year with you

all and kind of review some of what we've accomplished, I guess, in the last six or eight months.

I've got about 20 slides. As Katie mentioned, if there's questions as I go along, since it's a pretty small crowd, feel free to raise your hand or interrupt me and I'll see if I can't get your question addressed.

Just for a refresher, y'all have probably seen this slide. When we got started with this project, it's rather large, and we had to split it into three phases. The first phase was what we called the Time Critical Phase. It was the actual removal of ash from the Emory River itself. That was completed -- really the last train went to Alabama on December 1st of about a year ago. That was train number 414. A little over 4 million tons was shipped down to Alabama. The Emory River was opened right before Memorial Day in 2010. So Phase 1 is now officially complete.

Phase 2 and Phase 3 have been kind

of my responsibilities on this project. Phase 2, we're right in the middle of it. Most of my slides that I have tonight will talk about the progress we've made on Phase 2.

As a refresher, as you may recall, the action memo, the decision document for Phase 2, was issued in May of 2010. We've been busy working on that. We really got started on that in about last fall. It deals with the remainder of ash that's in the shallow backwaters of Watts Bar Reservoir, stuff we call the embayments. There's about 2.8 million cubic yards left out there. You'll see in some future slides here a good chunk of that has already been consolidated back in the cell. The other big piece of this Phase 2 work then is the perimeter containment piece that goes around the roughly 250-acre cell to design or to withstand some earthquake loads that I'll talk about.

Phase 3 is also ongoing right now. It deals with the residual ash in the

Emory River. Through the dredging efforts and because of some storm events that moved through during that work, we weren't able to remove all of the ash. It got commingled and washed a little bit downstream. So we are comprehensively evaluating the residual ash in the river to see what kind of residual ecological risks may be posed.

And, of course, the Phase 3 there will be long-term monitoring for this when the cell is closed out here in the next couple of years. We will continue to monitor groundwater, wells that are in the cell as well as probably some monitoring in the river long-term, as well.

This is kind of just really showing about three years recovery. We're approaching the third anniversary. This is, on the left here, what it looked like immediately after the spill on December 23rd. This is what she's starting to look like now. Some big things that I'll talk about later that I want to emphasize is one of the first

things that was done was some perimeter reinforcement and some buttressing work on this outer dike which is called Dike C.

A lot of y'all probably live in the area, so you've notice as you're coming down Swan Pond Circle here that there now is water in the north embayment. We're happy to report that the north embayment is full of water and ash free. This was taken on October 26th when we just had more than one-third of it. It was filled up above that little berm we put in there. With the, what, 7 or 8 inches of rain we had the first part of last week, water actually started backing up from the river and it has now completely filled the north embayment and our intention is to keep it there.

So what are we doing in Phase 2? You've seen this slide. It's kind of a carryover from some other stuff. But it's really excavating ash and then getting that ash back into the re-enforced engineered cell in the middle of the property. We're excavating ash with

really what I call an armada of yellow iron. There's a tremendous amount of pan scrapers and tract excavators and articulated dump trucks. It's a busy place.

This ash has to be dried to an optimum moisture content so it can be compacted and rolled back into the cell. That optimum moisture content really depends on the material and where it's come here. But we're trying to reach about a 17 to 27 percent moisture content on that stuff so it compacts better for us. We roll that out. When it's real wet, as we're approaching the winter season, we may -- to keep things and production moving along, we may add up to 6 percent lime to kind of facilitate that drawing.

The way -- this is pretty simple stuff really. We roll this out into one-foot lifts. It's then compacted to what's called 90 percent proctor, which is 90 percent of the end confined compressive strength. Then we have a series of

instrumentation that's actually in the cell where we're compacting material. It's looking at the densities, making sure that we're getting that 90 percent proctor.

We're looking at pore water pressures, making sure we don't get, you know, saturated ash again. And we're monitoring vertical movement, is it moving up and down, in this case it would be down, and is it moving horizontally, the potential to slide around. So we have target levels and thresholds up there on that. If we see excessive build-up of some of that stuff, we do back off areas and go to areas that are a little safer at that point in time and we wait for that water pressure and stuff to kind of dissipate.

In addition to the excavation of the ash and the stacking of the ash in the cell, another big part of what we're doing now is the perimeter wall stabilization. I've got some separate slides on that. I'll talk more about that.

Of course, you know, with several hundred people still on site, you know, health and safety is very important. The safety of our workers out there is paramount. We're continuing to keep up on our health and safety program in addition to the monitoring program. We've been monitoring out here really since we started. The primary monitoring that we're doing now is we're still monitoring air through a series of some perimeter air stations. I'll show you those in a minute. And we're still continuing to water -- excuse me -- monitor the quality of water that's coming off these embayments before it's discharged into the Emory River.

Here is a little picture of kind of the big scope of what we're doing. I think on the top here is really the calendar year. You can see where right here now at the end of calendar year 2011, you'll notice that most of our work here does go through 2014, but it changes over the years as we go through.

Right now we are, as I mentioned, done excavating in the north embayment. We're moving into excavation in the middle embayment also known as Swan Pond Embayment, kind of right in front of the cell there. We're going to continue ash stacking. Move me back up here. Ash removal actually really is scheduled to be completed by the end of next year.

From an ash removal and excavation standpoint, we've kind of approached the halfway point. We've made a lot of progress in this last year. This fall and summer was dry and it's really increased our productivities on the excavation and stacking. We're going to continue stacking through 2012 and probably into 2013 with the last little section of the ash pond.

Then the final piece, this is going to be a landfill, so it's a very traditional civil engineering practice. We're going to have to cap and cover this thing, put some grass on top of it so as to resist erosion and resist infiltration.

That will be the last pieces going in there. That's going to be done really in late part of 2013, early part of 2014.

Then the restoration piece that Katie mentioned at the start of this meeting is something then -- the planning for that is underway right now and that will be some of the -- that's what we like to say the cherry on top of the sundae. That's going to be the real neat stuff that we're all excited for.

This is a real nice picture, I think. It kind of gives you a snapshot of what we've accomplished since the Phase 2 work was started last fall. The north basement, again, was about 868,000 cubic yards of ash was removed out of there in a little over a year. Real good. Everybody on the job is real proud of that. It's really -- it's really nice, I mean I will say, to drive along Swan Pond there and see that thing full of water. I didn't have the luxury of seeing it before it was filled with ash, but it really does look nice. So it's ash free.

We have got about 379,000 cubic yards already pulled out of the middle embayment. When we talk about the middle embayment, it's this -- it's about a 50-acre area here. This is where the bulk of our excavation work has now shifted to. We've got about 825,000 cubic yards stacked back in the dredge cell all successfully and we've got about just under 500,000 cubic yards put back in the lateral expansion. We've been trimming off the top of the relic. That's got a drop. It's about 805 elevation now feet above sea level and that's got to go down to about 787. So we're going to continue to scalp that as we move forward.

The next area that we will be moving towards filling is this ash pond area here. It's not -- we're just kind of starting to think about putting some material in that. So that's just kind of a snapshot of the area we've been working in. Thank you.

Just a little word about ash excavation. We pulled the 868,000 cubic

yards out of the north embayment. Our volume estimates on that were pretty good. I think in the EE/CA days we were estimating just under a million. So we were actually just a little over. It's kind of -- these estimates are all kind of moving around. But I think we hit that number pretty close.

We have about another -- there was about a little over a million cubic yards in the middle embayment. We've got about, what's that, about 38 percent, so we're getting close to halfway in the middle embayment. This kind of just shows the trend on, you know, what we're doing from the middle embayment.

Our production has slipped a little bit, as you might imagine. It's hard to move this ash when it's as wet as it is out there, but we're getting all that stuff figured out for our winter operations and we continue to keep working on that.

A little bit of ash stacking. As I mentioned, I think I would characterize it

as we're about halfway done with this Phase 2 work. You can see the dredge cell is about 53 percent full. That was that 850,000 number I showed you. We've got about as much stack as we can in there right now until we can get the perimeter wall around it and the rest of this balance is what we're calling the in-fill that's going to go around on top of what we've got out there now.

The lateral expansion is just under halfway full. We've got about 640,000 in there of about 1.5 million. As I mentioned, the next area we're going to stack is the ash pond and we've just gotten started on that. I really don't have any numbers to report.

Perimeter wall stabilization. You've heard this piece before from me, I guess. You know, what we're guarding against on this is because of the root cause and all the good geotechnical work that was done afterward to determine what caused this failure. This is going to be based on -- we're redesigning and

re-engineering this cell to withstand two earthquakes is what we're trying to guard against, failure under earthquake loads. It's going to be a 6.0 quake on the East Tennessee fault line and then the big quake is a 7.6 on the New Madrid. The East Tennessee fault line is about 40 kilometers away from here and the New Madrid is over 400.

So it's about 2 miles around this thing. It's 11,500 linear feet all the way around. The 250-acre cell, it's going to go down through ash and it's going to be keyed into the underlying bedrock. The bedrock underlying this is a shale and it's going to be keyed into that 2 to 3 feet to resist that sliding that could be induced through liquefaction and earthquake.

This UCS is unconfined compressive strength. That's the design. It's one of the specs we're trying to meet. The material that we're putting in the ground through this construction equipment, we want the average UCS for this segment to

be 280 pounds per square inch.

We're doing this with the biggest excavators that I've ever seen. I'm a civil engineer, so I get excited about this stuff. But it's a Kamatsu 1250. It's a monster. It's got a hundred foot boom on it. The way we're getting into the shale bedrock underneath is this is a 4-foot-wide bucket and it's got these big old ripper teeth on there. The operator takes it down to the desired, you know, depth and then you can feel that resistance on the shale bedrock and then those ripper teeth just tear into that.

Then we have technicians in the field where we actually put a little bridge. Once we think we get close to the design depth -- we've done borings around the likely alignment of this thing so we know where to expect topper rock. Once the operator thinks he has gotten to the specified depth and he's got the appropriate key, we put a little bridge on this thing and we send a technician out with his pretty little key or pretty low

tech, but it's just a big old measuring tape and that 50-pound weight takes it all the way to the bottom and then we verify it. We knew topper rock was at X and now we know we're 3 foot into it, so we give the thumbs up when we're appropriately keyed in.

The recipe here is how we're going to get that 280 PSI. The bulk of this material is actually water. It's a slurry. It's pumped in from this batch plant. It consists of -- it's about, what is that, 73 percent water. It's 25 percent -- up to 25 percent fine blast furnace slag. That's what's giving us most of our PSI, pounds per square inch. It's got about 3 percent bentonite which is a powdery clay. Then it's just only -- it has only about a half percent of Portland concrete, Portland cement. That half percent Portland cement is kind of what triggers and then to get that 25 percent of fine blast furnace slag to try to set up and give us the compression strength that we need.

This is what the wall looks like. When I say wall, what people will think is, well, this thing is going to be sticking out of the ground. You won't see most of this. In fact, you won't see all of this or any of this. This is all from ground down to rock. It's all subsurface wall.

The first segment we're building is could be -- probably the best analogy to use is it looks like a railroad track. So you have an inner wall that goes around the inner part of the cell. That's 11,500 feet around, you know. Then you've got this outer wall that's 100 feet outside of the inner wall. So that's the railroad track. That would be your tracks. Then in between your railroad tracks, you've got these little cross ties, or in this case we're calling them sheer walls.

All right. In this first phase we're building, these sheer walls are 20 feet spacing. So you've got an inner wall, an outer wall, and then what

connects up the railroad tracks is these cross ties or these sheer walls every 20 feet. These are 100 feet long. You've got 90 feet between these and then it -- excuse me -- 100 feet between these and then it sticks out 10 feet for a little buttress.

This is looking at -- as if you were looking on top of it. I just kind of showed you a cross-section. If you were standing and looking down on top of it, this is what it kind of looks like. Inner wall, outer wall, and then these sheer walls, how they stick out here 10 feet on the end. And it's 4 feet wide. This trench that we're constructing is 4 feet wide.

This is what the wall looks like on the layout. Again, 11,500 feet around. The first section that we're working on was actually the section that was probably the critical link. It was kind of the weakest link in the chain. This is where it did fail. So this has gotten most of our attention as being the critical

section.

The next area, there's a little wall here that's called Wall Section 8. We're looking to either start Wall 8 here soon or start working on this section down Swan Pond corridor, Section 7. But it is split up into eight different segments, so we can't build this thing all at once. But we do have two excavators working out there.

This is the first wall. We did a pilot test on this thing in April to kind of test the concepts. Once Geocon -- I failed to mention the contractor that bid for and actually was awarded this work is Geocon. They've been in the business quite a bit. They're one of the most sophisticated and one of the more experienced contractors in this business. They started on a pilot phase about 400 feet in late April, early April, did a bunch of data collection looking at how we did on that pilot demonstration, made a couple of tweaks to the design and then full scale work on this started I believe

it was July 19th. So since July 19th, for the last four or five months, we've got about 70 percent of that. The first length of this segment was 1800 feet. So we're looking to get this thing finished up.

One thing I want to mention about this wall is that it's being heavily sampled. 20 percent of it is being cored. So for every 500 feet that we put down, we are sampling very comprehensively 100-foot sections and where we're doing multiple depths and to verify that we're getting the unconfined compressive strengths, to verify that we're getting rock embedment to make sure that all our title specifications are being required -- are being met.

You all have seen this. This is the Dike C buttress. This is one of the first things that was done. A lot of this was during the time critical work. The Dike C buttress was just over a mile in length. I think it was about 5,000 feet. It was really a series of three layers of

rock and filter sand to make sure we didn't have any reeling and any additional breaches in the thing.

To do so, actually the new skimmer wall was done. This skimmer wall was compromised, severely compromised. It was actually blown over the night of the spill. That's been completed. We've got some of the new outlet structures associated with the stilling pond installed, as well.

As I mentioned earlier, we're continuing to monitor and we will monitor until this project is through. This shows you the surface water stations that we're monitoring. We've kind of scaled back our monitoring. Back at the time critical, we were basically sampling, you know, water every day out there. We've went back to three times a week and now we're doing once a week at three primary stations.

TVA has a permit with the State of Tennessee for the quality of water that's discharged here from the stilling ponds and we're continuing to grab samples from

the stilling pond once a week and then we're continuing to grab surface water that comes out of our storm water management ponds once a week.

The contaminants, I guess, that we're most interested in are arsenic and selenium and these graphics up here kind of show you where we're at. Of course, red is a bad value and green is where we kind of want to be. You can see we're kind of bouncing around. This is arsenic coming out of here, out of the embayment. The number -- the drinking water standard for arsenic is 10 parts per billion, the fish and aquatic life number is 150 parts per billion, and the water coming out of our sediment management ponds is kind of bouncing in between the fish and aquatic life water and the drinking water standard. Of course, nobody is drinking this water. Of course, it's treated before anybody drinks it. But we would expect to see some of these results like this as long as we have, what, another 7 or 800,000 cubic yards of ash in the

middle embayment. As this water comes through it, we're going to continue to manage it and continue to settle it. But we're keeping an eye on it.

The stilling pond water looks really good. It has a chance to settle and we're hitting that with some polymers and stuff to increase the quality of water coming off that. So that's looking good. That's just a little snapshot of what the surface water looks like. I think air is next.

Air we're continuing to monitor continuously 24-7 at five stations that surround the ash operations. This is a little graphic that shows you how we're doing on air. Air quality has been -- has always been and continues to be very good here. We've got water trucks. We haven't needed dust suppression here the last couple of days. But when it is dry, we have water trucks continuously circling the site to keep this stuff wet and keep that material down.

This is -- the national ambient air

quality for this is PM 2.5, the real, real fine silica particles and dust. That number is up at 35. We've set our action levels at 75 percent of that to be adequately conservative and we're still doing real good on air quality here. So we're pleased with that.

I guess really in conclusion, we kind of went through all this stuff, but again, we're very happy and very pleased to report that the north embayment is ash free and now full of water. The perimeter wall progress is coming along. We're still trying to tweak that. That is probably the challenging part of this job with the wet conditions and stuff. We're looking at ways to increase that production. We're looking at ways to beef up the working platform. These Kamatsu 1250s are big pieces of equipment. They have a tendency to want to sink into wet ash, so we're looking at ways to kind of beef up the working platform they sit on as they dig.

A little word about Phase 3 and

where we're at on that. I know several members of the CAG, we had a real nice environmental research symposium over at Roane State the first part of August where we invited all the researchers that are participating in the Phase 3 data collection again for the river system. All those results are starting to come in. All the data that was called for in collection in the work plan that we approved last May or June, all that data has been collected and we're in the process of analyzing it and getting it dumped into what we're calling interim deliverables, which are technical memorandums. So if you're interested in what we're seeing in three types of amphibians, we had a couple of frogs and a toad, all kinds of birds, turtles, tree swallows, fish and raccoons. There's been samples of surface water, groundwater, chronic vegetation and periphyton, which is fish food, and then we had a real big memo that talked about mapping the residual ash deposits.

As I mentioned, we think we have anywhere from 250 to 500,000 cubic yards of ash out there that was disbursed because of 70,000 CFS of flows coming down the Emory River. So we've been collecting many, many, many, many samples trying to track that stuff and find out where it is. If you all are curious and want to, you know, get a sneak peek of what we're finding here so far, I have posted all of those technical memorandums on our webpage which is right here. Go to the left hand column and look at Non-Time-Critical documents and then click that and it will open it up and it will say tech memos. Of course, if you have any questions, if you can't find that, shoot me an e-mail and I'll make sure you can get to it.

So really the next formal -- I mean we'll continue to do these updates as needed and as warranted. The next time you will see, you know, us in a formal public meeting with public comment periods and that kind of stuff will be for the Phase 3 action memo. We're expecting that

decision to happen next year. All the ecological risk assessments going on right now, we're kind of right in the middle of that Phase 3 effort. I expect to see that risk assessment as far as distributing or delineating what we think the potential risks posed to all these receptors is, that should start coming into focus really in the spring of this year.

I'll be back up here probably on this stage talking about what we propose to do about that stuff about mid year. It may slip into the end of 010, but I'm pretty sure and I'm pretty confident that we will have a Phase 3 decision document out for review and completed easily from a year now.

So I showed you on one of those first slides our construction schedule, you know. This job has kind of slipped into routine, as routine as a job this size can get. It's really just picking up ash, stacking ash, and continuing up on our monitoring and our health and safety programs.

Just some pictures that we have out there on our webpage. I know TVA has some scattered. I know they have them on their webpage. But this just shows a picture of the ash stacking. It looks like a big flat table out there. It's looking good. This is a good picture of Dike C. You can see the rock buttress on the outer perimeter. This is lateral expansion. It has come up quite a bit. We've got just under 500,000 cubic yards in there. The next area we're going to start stacking in is right over here in the ash pond.

This is all the work on Dike C. The new skimmer wall in. Something kind of interesting. There was an old little bridge here, causeway bridge that went over to TVA lands here in the area. We called it a peninsula. Once we put this buttress in, it stuck out so far into that intake channel -- this is the -- TVA uses -- they pull water out of this for use at the plant -- it narrowed that channel up enough that the water was really -- we thought the water would really be rushing

through there real fast. So the plant people decided they didn't need this bridge any more, so we tore that bridge out to keep that opening a little wider to reduce the velocities in there. That's the main reason we took that down.

Just some before and after pictures of the north embayment. These were taken in October. You can see that, you know, the upper third of this water diversion dam that we put in had filled up with spring water coming from the Old Gupton wetland area. You can see lots of brown dirt. You know, brown dirt for me is good to see. Brown dirt means that's ash free.

I guess I failed to mention, but there was a bunch of confirmation samples out here. We laid out a grid. Once the civil projects crew thought they were getting real close to meeting the ash free goals that we've set on the confirmation criteria, we actually -- this is all being based on visual, we're looking at this stuff through microscopes. There was a bunch of samples taken and eight

concurrence packages prepared to demonstrate that we have cleaned that up to pre-spill bathymetry.

I think this is the last slide and then we'll take some questions. This is the east embayment. Of course, the east embayment was cleaned up under the Phase 1 work and it's clean really I think since July of 2010. That looks really good. I'm told by the anglers in the area that fishing in here is really darn good right now.

So I think with that, that's the last slide, isn't it, Mike? Thank you. I kind of went through those real fast and I talk fast. If there's any questions and if the CAG wants to say anything, we're happy to.

JONI MORGAN: Hi. I think everybody knows who I am pretty much. I'm Joni Morgan. I'm the chair of the CAG, which is the Community Advisory Group. I just wanted to remind people that the Community Advisory Group is an all volunteer group of civilians just like

anybody who lives out there in the community. We don't work for any of this alphabet soup of groups that we have helping us out on this project. But we're fortunate to be allowed to work with them and we are representing to the best of our ability the community and trying to help make sure that the cleanup is done to reflect the community's needs and wishes and safety.

So I do have a handout over here with some of these websites on it. If you would like something to take home so that you can go check it out without having to remember all of those little letters, you're welcome to come over and visit our table. And if you would like, I do send out information as I get it. So if you would like to be on our mailing list, you can add your name. But I thank you all for coming, whether you came as a civilian or part of the alphabet soup group. We need all eyes and ears on this project to make sure that it works out for everybody's best interests. Thank you.

KATIE KLINE: Does anybody have questions? Anyone? Well, if not, we'll be available around the room and you're welcome to come by and ask individual questions of folks. We have Barbara Scott with TDEC back here. Barbara, raise your hand. Sorry. I meant to do that earlier. Brad Parman with the Tennessee Department of Health is here. So we have lots of folks here that can answer any questions that you have. So ask away.

(Meeting concluded.)

REPORTER'S CERTIFICATE

STATE OF TENNESSEE:
COUNTY OF HAMILTON:

I, Tracy A. Beamon, Certified Court Reporter and Notary Public, do hereby certify that I reported in machine shorthand the December 8, 2011 Meeting in the above-styled cause; that the foregoing pages, numbered from 1 to 35, inclusive, were typed under my personal supervision and constitute a true record of said proceedings.

I further certify that I am not an attorney or counsel of any of the parties, nor a relative or employee of any attorney of counsel connected with the action, nor financially interested in the outcome of the action.

Witness my hand in the City of Chattanooga, County of Hamilton, State of Tennessee, this 5th day of January, 2012.

_____
Tracy A. Beamon, CCR-1003
My Commission Expires on the
18th day of February, 2015.